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ABSTRACT

This study was implemented to assess the state of computer technology in the Tri-County area; to determine the status of computer usage; and to provide a frame of reference for the broad technological status for comparison among schools. The population of the study, consisting of 91 elementary schools, 30 middle/junior high schools, and 25 secondary schools, responded to a survey requiring both qualitative and quantitative responses. Analyses of the data indicated that there is a wide range in the amount of computer usage at all school levels; the Tri-County area has the necessary hardware to effectively use computers in instruction; schools are limited by the lack of teacher experience and type of software; the student/computer ratio at all levels in the area is below the national average; 57% of the computers in schools were located in labs primarily found in middle and secondary schools; and the potential for successful implementation of computers in the area hinges on the development of a clear-cut plan for the integration of technology into the schools at the district level. Charts and tables illustrate the findings of the survey and a copy of the questionnaire is appended. (ALF)

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Status of Educational Computing in Peoria, Woodford and Tazewell County Public Schools

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Bradley University
Peoria, Illinois

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Status of Educational Computing in Peoria, Woodford and Tazewell County Public Schools

Introduction

It has been 15 years since the appearance of the microcomputer in the market place and the initial incorporation of this technology in the nation's schools. Interest in educational computer applications in the Tri-County (Peoria, Tazewell, and Woodford) area began ten to twelve years ago with a number of schools purchasing computers and related software primarily through monies generated by schools' parents clubs. Along with this, budgets were established in various districts for the purchase of this technology. Some schools and districts moved into this with great enthusiasm. Others chose to wait.

The technology has shown tremendous growth during this 15-year period. Hardware and software have evolved far from low-capacity 4 kilobyte stand-alone machines with little available software to computers with storage measured in megabytes, many powerful peripheral devices, using multimedia courseware, and utilizing telecommunications to expand the user's power.

It has been very difficult to assess the state of computer technology in the tri-county area. Districts vary in size, wealth, and commitment to computer technology. Districts have asked about the status of computer usage in the area on numerous occasions. School personnel want some frame of reference of their technological status in relation to other schools. Information is available on a school by school basis through on-site observation and discussion, but there is no broad perspective of technological status. There is no central collecting agency for this type of data. It was with this in mind that we chose to implement this study. It is hoped that the results contained herein will be of some value to the school personnel of the area.

Methodology

Population

The population examined in this descriptive study consisted of all public schools in the Tri-County (Peoria, Tazewell, and Woodford) area (N = 146) There were 91 primary/elementary schools, 30 junior high/middle schools and 25 secondary schools.

Instrumentation

The survey instrument was constructed to answer some of the more pressing questions related to educational computing in the area. The questions were constructed to generate both qualitative and quantitative answers.

Limitations

This study employed the self-report method and is subject to the limitations of that design. A major limitation of this study was the rate of return (62%) of surveys despite follow-up mailings and phone calls. In addition the results of this study are not generalizable beyond the Tri-County area.

Procedure

Upon receiving a Research Excellence grant from Bradley University, the survey items were written to answer the research questions concerning the status of computers in the Tri-County area. The items were assembled into the completed survey in January 1992. Superintendents in each of the districts were sent a letter in January requesting permission to utilize their schools in the study. In some cases the superintendents surveyed their schools to see if there was a willingness to participate. Others gave permission to contact the schools directly. Five (5) schools chose not to participate. Letters and the survey instrument were sent to each of the remaining schools in the Tri-county area in February with a March return date. Follow-up calls were made and letters sent to those schools not responding to the initial mailing.

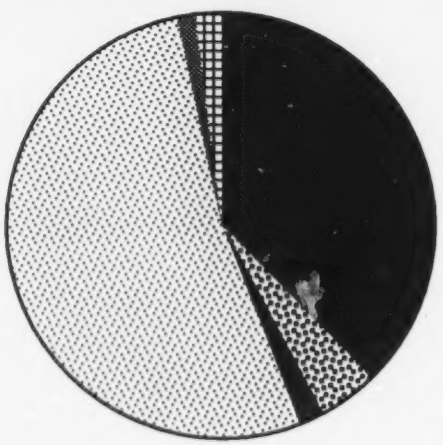
As the surveys were returned each was numbered, identified by grade level, and the comments from Question from 7, 8, 9, and 10 were recorded. When all surveys were returned the analysis of the data began.

Analysis of Survey Data

Although data were generated from participating schools, there was no attempt identify specific schools nor have the data been analyzed on the basis of the individual counties involved.

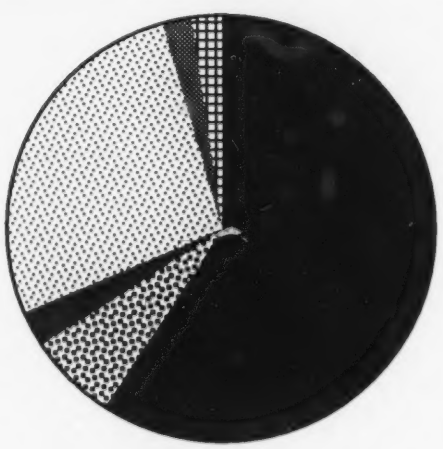
The following charts describe the status of educational computers for all responding schools (N=90). Note: Where discrepancies existed, numbers reflect the best possible interpretation of responses given.

Types of Educational Computers - All Schools



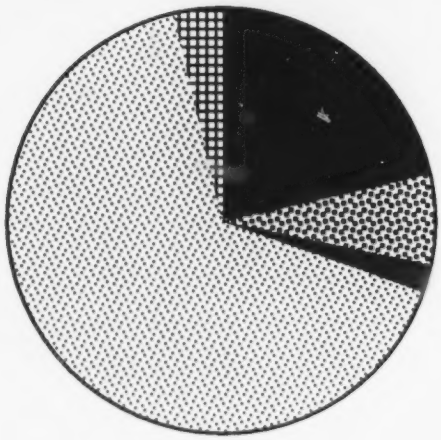
		# of Computers
Apple II	37.8%	1098
Commodore	4.4%	128
Macintosh	2.0%	58
MS DOS	52.3%	1517
Radio Shack	1.6%	47
Other	1.8%	53
TOTAL	99.9%	2901

Types of Educational Computers - Primary/Elementary Schools



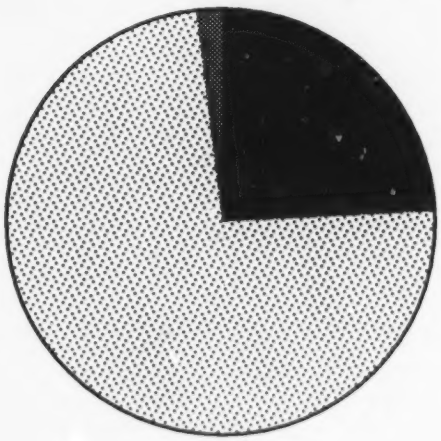
		# of Computers
Apple II	59.3%	719
Commodore	6.7%	81
Macintosh	2.6%	32
MS DOS	27.0%	327
Radio Shack	2.2%	27
Other	2.2%	27
TOTAL	100%	1213

Types of Educational Computers - Junior High/Middle Schools



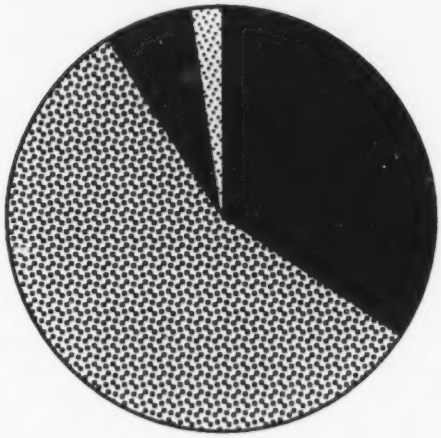
		# of Computers
Apple II	21.5%	151
Commodore	6.7%	47
Macintosh	2.3%	16
MS DOS	65.8%	462
Radio Shack	0.0%	0
Other	3.7%	26
TOTAL	100%	702

Types of Educational Computers - Secondary Schools



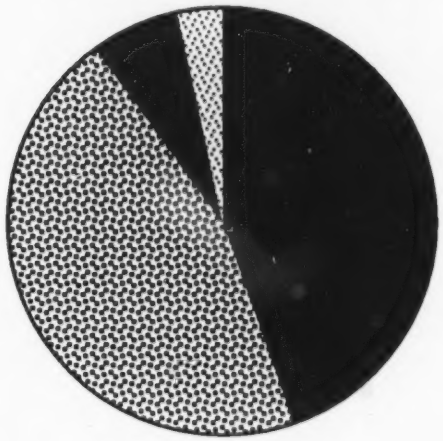
		# of Computers
Apple II	23.1%	228
Commodore	0.0%	0
Macintosh	1.0%	10
MS DOS	73.8%	728
Radio Shack	2.0%	20
Other	0.0%	0
TOTAL	99.9%	986

Location of Educational Computers - All Schools



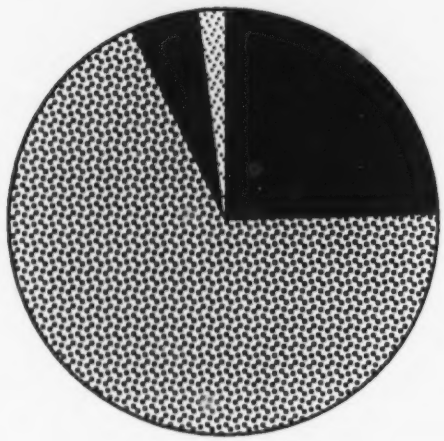
		# of Computers
Classroom	34.3%	975
Lab	56.7%	1610
Library	6.7%	190
Other	2.3%	65
Total	100%	2840

Location of Educational Computers - Primary/Elementary Schools



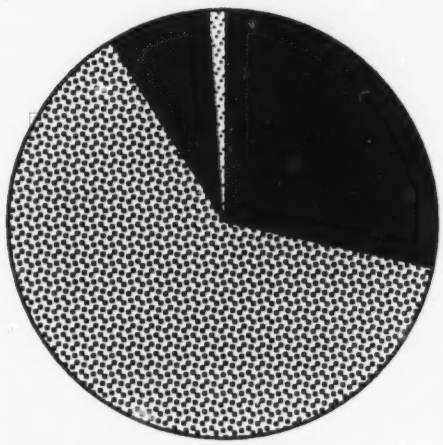
		# of Computers
Classroom	44.6%	538
Lab	45.4%	547
Library	6.6%	80
Other	3.4%	41
TOTAL	100%	1206

Location of Educational Computers - Junior High/Middle Schools



		# of Computers
Classroom	24.5%	172
Lab	68.2%	479
Library	5.4%	38
Other	1.9%	13
TOTAL	100%	702

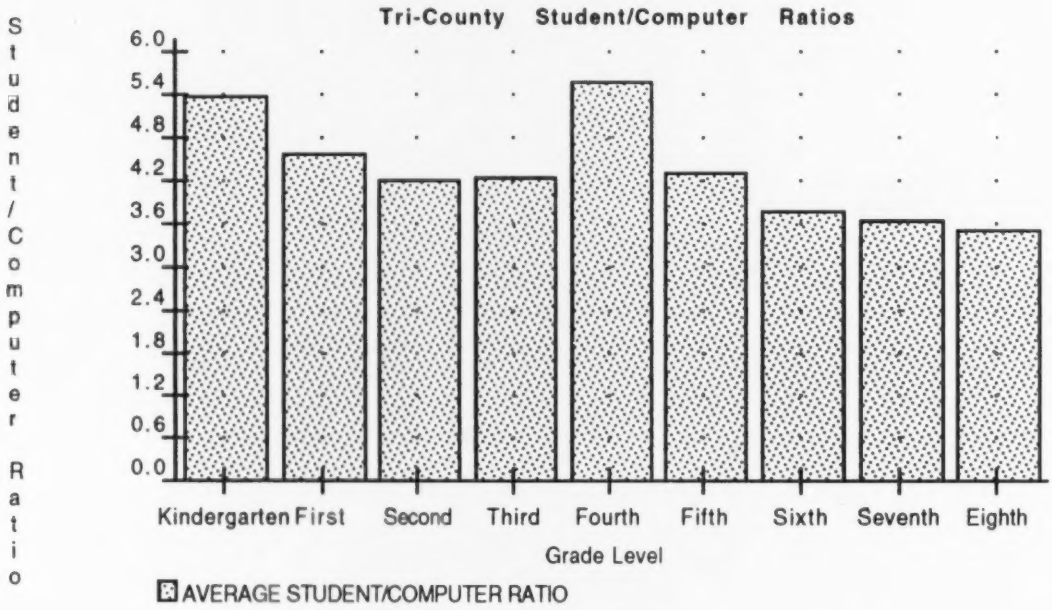
Location of Educational Computers - Secondary Schools



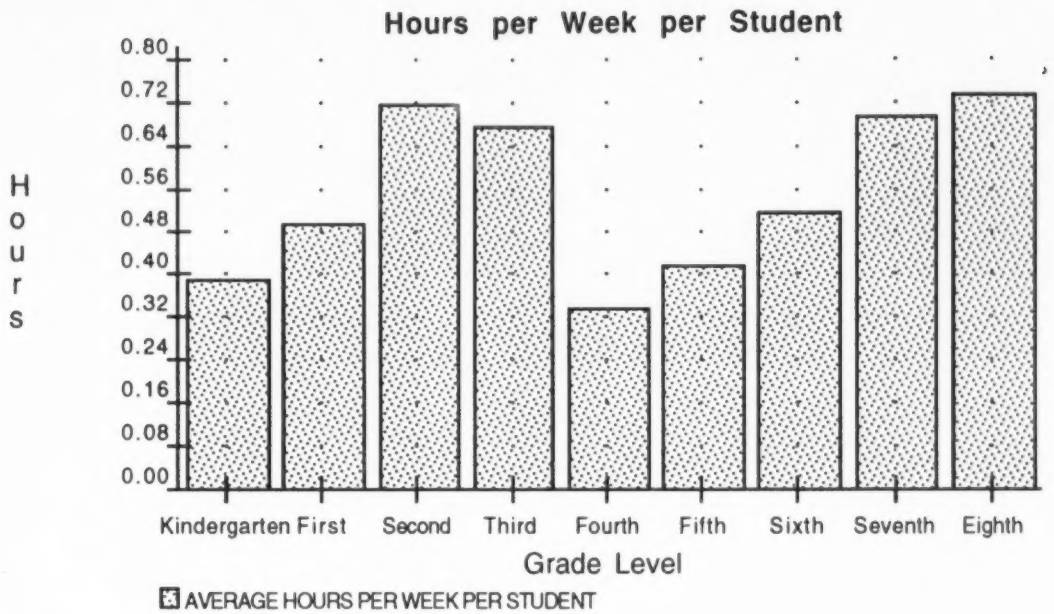
		# of Computers
Classroom	28.4%	265
Lab	62.7%	584
Library	7.7%	72
Other	1.2%	11
TOTAL	100%	732

Question 4a - Average Computer Usage by Grade Level

	Number of Students	Number of Computers	Computer Use (Hrs.)	Total Use (Hrs.)
Kindergarten	47.47	8.90	2.98	17.91
First	45.35	9.97	3.47	22.05
Second	43.23	10.39	4.06	30.72
Third	45.29	10.76	4.13	30.57
Fourth	47.21	8.52	4.10	15.53
Fifth	56.76	13.26	3.39	23.26
Sixth	57.38	15.31	2.77	29.17
Seventh	64.93	18.00	2.50	44.96
Eighth	61.81	17.81	2.81	45.09



Student to computer ratios in the area Tri-County K-8 schools are much better in the responding schools than the eighteen to one ratio cited as a recent national average (Kondracke, 1992). A possible explanation for the higher ratio in kindergarten is that kindergartners are given the lowest priority status for computer usage. However, the data offered no explanation as to why the ratio was higher for fourth graders.



The greatest usage of computers in the Tri-County K-8 schools who responded appears to be in second and third grades and seventh and eighth grades. Two possible explanations are that the hardware is concentrated at those grade levels (2 & 3, 7 & 8) or that software is targeted at those grade levels and lacking at others. There appears to be a large amount of early learning software in use at the primary level as well as applications software being utilized in the upper elementary grades.

Question 4b - Frequency of Computer Usage (hrs/wk) by Subject

Junior High/Middle School

Note: Some schools have multiple labs, therefore total hours exceeded hours in school week.

Subject	Average Frequency (Hrs./Wk.)
art	0.63
business	0.39
foreign language	0.21
industrial arts	0.37
language arts	6.14
math	4.45
music	0.18
science	2.03
social studies	1.57
other	4.18

High School

Note: Some schools have multiple labs, therefore total hours exceeded hours in school week.

Subject	Average Frequency (Hrs./Wk.)
art	0.44
business	30.38
foreign language	1.94
industrial arts	11.09
language arts	7.84
math	4.41
music	0.50
science	7.31
social studies	1.09
other	7.19

Question 5a Type of Software in use by Grade Level

Note: Numerals indicate the number of schools reporting.

Grade Level	Tutorial	Drill	Simulation	Game	Tool	Totals
Kindergarten	22	27	7	21	10	87
First	19	32	7	25	11	94
Second	18	30	10	26	11	95
Third	25	34	15	29	13	116
Fourth	17	33	18	25	17	110
Fifth	23	35	23	31	22	134
Sixth	21	30	20	25	22	118
Seventh	13	20	16	14	17	80
Eighth	14	19	16	14	17	80
Total	172	260	132	210	140	914

Question 5b - Type of Educational Software in Use by Subject

Note: Numerals indicate the number of schools reporting.

Grade Level	Tutorial	Drill	Simulation	Game	Tool	Totals
art	3	0	1	2	11	17
business	9	6	5	5	18	43
foreign language	6	6	2	5	1	20
industrial arts	5	4	3	3	12	27
language arts	30	39	12	29	35	145
math	29	47	21	34	17	148
music	4	5	3	4	3	19
science	34	32	29	24	13	132
social science	23	25	27	27	11	113
other	9	7	3	8	13	40
Totals	152	171	106	141	134	704

Question 6 - Most frequently used software programs.

ELEMENTARY SCHOOLS

* f	Software Title
15	Appleworks
11	Oregon Trail
7	Where in the USA is Carmen Sandiego?
7	Where in the World is Carmen Sandiego?
7	Word Munchers
6	Reader Rabbit
5	Print Shop
4	Bank Street Writer
4	Math Blaster
4	Odell Lake
4	Speedway Math
4	StickyBear Math
4	StickyBear Reading
4	Writing to Read
3	Children's Writing and Publishing Center
3	ClockWorks
3	IBM Measurement, Time and Money

** f = number of schools listing program.*

JUNIOR HIGH/MIDDLE SCHOOLS

* f	Software Title
11	MS Works
8	IBM Touchtyping for Beginners
7	IBM Math Concepts
5	Cross Country
5	Reading for Meaning
4	Linkway
4	Math Practice
4	Oregon Trail
4	Where in the USA is Carmen Sandiego?
3	Express Publisher
3	IBM Punctuation
3	Spelling Package
3	Wheel of Fortune
3	Where in the World is Carmen Sandiego?

** f = number of schools listing program.*

Secondary Schools

* f	Software Title
14	Word Perfect 5.1
9	MS Works
8	Lotus 1-2-3
7	DBase
3	Appleworks
3	PFS Professional Write
2	AutoSketch
2	Print Shop
2	Turbo Pascal
2	Typing Tutor IV

** f = number of schools listing program.*

Question 7 - Summary

Does your school have a modem for instructional use?
If yes, describe how your school is using telecommunications in instruction.
List some projects on which your students have worked.
List any telecommunications services that your students or teachers use.

ELEMENTARY SCHOOLS

Total Surveyed 51
# of Responses 50

Total Using 8

Projects: Penpals, Story and Poetry writing between schools, comparison shopping, surveys, networking between other accelerated schools; National Geographic Society Kids Network - Hello Unit, Acid Rain, Pets, What's in Our Water?, What Are We Eating?, Weather, Too Much Trash

Services: National Geographic Society Kids Network, Heartland FreeNet, FrEdMail, Prodigy, A.T. & T., NASA Bulletin Board

Summary: Few elementary schools in the Tri-County area are using telecommunications in instruction. One school reported having a modem, but not using it. The 8 schools reporting modem use appear to be involved in many projects.

JUNIOR HIGH/MIDDLE SCHOOLS

Total Surveyed 20
# of Responses 20

Total Using 6

Projects: Penpals, progressive Stories, poetry exchange, cultural exchanges, teachers receive electronic guides for CNN Newsroom

Services: CompuServe, Heartland FreeNet, FrEdMail, Prodigy, Minitel, ILVS, CNN Newsroom, PSINet

Summary: Few junior high/middle schools in the Tri-County area are using telecommunications in instruction. Two schools reported being in the initial stages of exploratory activities in telecommunications. One school reported that only teachers used telecommunications (CNN Newsroom Guides). One school has a computer/telecommunications club which meets after school. Three schools appear to be involved in several telecommunications activities.

SECONDARY SCHOOLS

Total Surveyed 16
# of Responses 15

Total Using 4

Projects: Dialog Online Research, Demo Unit on Telecommunications, Rivers Project

Services: Heartland FreeNet, Infotrac, Compton's Encyclopedia, Express Exchange

Summary: Few secondary schools in the Tri-County area are using telecommunications in instruction. Three schools are using telecommunications primarily to conduct library research and only one school reported using telecommunications for interactive projects among schools.

Question 8 - Summary

Describe the level (novice, experienced users), type (in-service, college course), and frequency of teacher training on computers in your school.

ELEMENTARY SCHOOLS

Total Surveyed 51
# of Responses 47

Level of Training:

Most schools reported a wide range of faculty experience with computers. A few schools have highly-experienced cadres of computer-using faculty members. A number of schools reported one or two "experts" with the remainder having limited computer experience.

Type of Training:

A majority of schools offered no or little formal training. Most teachers acquired their computer expertise by self-instruction or peer tutoring. Those schools with an "expert" usually relied on that individual to provide necessary inservice training. A number of teachers from various schools participated in district-wide or Mid-Illini Educational Service Region workshops. Some teachers obtained initial training through college course work.

Frequency of Teacher Training:

Training was reported to be infrequent and sporadic.

Summary:

Most schools have at least one computer "expert" but the majority of those schools surveyed indicated a lack of experience and training for the majority of the faculty.

JUNIOR HIGH/MIDDLE SCHOOLS

Total Surveyed 20
# of Responses 17

Level of Training:

All schools reported that they have a majority of their faculty at the novice level. Many schools indicated that a small number of teachers in the building have advanced levels of expertise.

Type of Training:

The most popular method of training reported was inservice conducted by districts and/or Mid-Illini Educational Service Region. A small number of teachers have had one or more college level courses.

Frequency of Teacher Training:

Inservice training was stated to be limited to one or two workshops per year.

Summary:

Junior High/Middle schools appear to have a lack of faculty trained in computer usage as well as limited opportunities for the professional development of computer expertise.

SECONDARY SCHOOLS

Total Surveyed 16
# of Responses 14

Level of Training:

A dichotomy exists at the secondary level between experienced computer users and novices (nonusers). Approximately one-fourth of the secondary faculty were identified as being at the experienced level and the remaining three-fourths were novices and/or nonusers.

Type of Training:

There is some indication of college level computer coursework particularly among the experienced users with lesser amounts among the novices. Inservice appears to be limited at the secondary level - what is available is generally provided by the district and/or the Mid-Illini Educational Region.

Frequency of Teacher Training:	Inservice opportunities are limited for secondary faculty. Inservice seems to be limited to one or two sessions per year and not necessarily geared to all levels of expertise. Some faculty are supplementing their training through college level coursework.
Summary:	A greater number of secondary faculty have some college coursework about computers than either elementary or junior high/middle faculty. There is less inservice offered possibly due to the difficulty of offering sessions which would be relevant to all faculty.

Question 9 - Summary

Describe the policies for purchasing, maintaining, and replacing computers at your school.

ELEMENTARY SCHOOLS

Total Surveyed 51
# of Responses 49

Computers are purchased as funds become available. Schools obtain funding through their districts, parent-teacher organizations, Chapter 1 and 2 funds, and private donations. There is no consistent plan for maintenance although some schools have maintenance contracts with dealers, and others do their own maintenance/repair. No schools reported having a plan for the replacement of obsolete computers with newer technology.

JUNIOR HIGH/MIDDLE SCHOOLS

Total Surveyed 20
# of Responses 18

Purchasing decisions are primarily made at the district level in the larger districts. Funding may come from districts, parent-teacher organizations and private donations. Larger districts maintain and repair their own equipment while smaller districts tend to rely upon service contracts or general funds as the need arises. No long range contingency plans were identified for replacing nonrepairable hardware nor to provide for the evolution of technology.

SECONDARY SCHOOLS

Total Surveyed 16
# of Responses 12

Only one school indicated a cohesive plan for the purchase, maintenance/repair and replacement of hardware. Other schools reported that purchases were made by the district or school when funds were available, maintenance/repair was done as needed, and no plan for replacement/upgrade of the existing hardware was in place.

Question 10 - Responses

Other aspects of educational computing at your school that you would like to share...

ELEMENTARY SCHOOLS

Total Surveyed 51
# of Responses 18

Sample Responses:

- Open computer lab for free time student use
- BASIC programming
- Keyboarding and word processing for fourth and fifth grades
- Use integrated technology to produce videos in seventh and eighth grades
- Upper grade students write, edit and publish school newspaper using computers
- Library going to computer management and possible electronic encyclopedia for student use and possible networking
- Individual blocks of time given to classes to come to supervised lab
- Computer Career Awareness
- Writing to Read Lab and Learning Center. Computers and technology are an integral part of the district and building strategic plan. Have a laser printer. All grades use computers in the academic day.
- Networking, telecomputing and "gypsy" labs
- Experienced users tutor those who would like to learn more.
- Had a structured computer lab for five years, but has lost funding.

JUNIOR HIGH/MIDDLE SCHOOLS

Total Surveyed 20
# of Responses 6

Sample Responses:

- high level of student experience, (using since fifth grade). Literature class uses computers. Eighth grade science uses computers once a week for 9 weeks. Remainder of teachers do not use nor wish to use computers.
- Junior high teacher holds Carmen SanDiego Tournament yearly.
- Computer club meets after school weekly. Students choose what to work on.
- Teach computer science to all children in building. Program is in 10th year and has evolved to meet needs.
- Just beginning and needs to be encouraged.
- MECC membership. Networked IBM lab (Novell/ICLAS). 30 station Discourse Lab. 3 CD ROM Reference station with Grolier's Electronic Encyclopedia. Proposed for 1993 - Mac LC CD-ROM Reference Station, Linkway Hypermedia (video capture), Bar 'n Coder for laserdisk
- Discourse Lab. Four Macintoshes for teacher use.

SECONDARY SCHOOLS

Total Surveyed 16
# of Responses 4
Sample Responses:

- Hardware and software inventory currently being developed
- Apple lab with 16 computers available 7 hours per day

Summary and Implications

There is a wide range of computer usage at all levels - some schools report no use at all while others report extensive usage throughout the building across all grades and/or subjects. Fifty-seven percent of all the computers in the reporting schools were located in labs. The labs were primarily found in middle and secondary schools. Computers in primary schools were equally divided between individual classrooms (44.6%) and computer labs (45.4%). Few computers (approximately 6.7%) were placed in library/media centers.

Student to computer ratios for the reporting schools were smaller than the national average at all levels. Students at all grade levels spent less than one hour per week using computers assuming a one to one relationship between student and computer. Language arts (6.1 hours) and math (4.5 hours) were the dominate areas of use reported at the Junior High/Middle level. At the secondary level, business (30.4 hours) accounted for the largest portion of

computer usage followed by industrial arts (11.1 hours). The most popular type of software in use at the k-8 elementary level were drill and practice (25%) followed by games (20%). At the junior high/ secondary levels drill and practice (24.2 %) was the leader in usage followed by tutorials (22%). Tool software was the most widely reported type of software to make a school's top ten list.

Generally, telecommunications are not being used in the Tri-County schools. Only 16% of elementary schools, 30% of middle/junior high schools and 27% of secondary schools reported some form of telecommunications activity. Based upon the data reported, a question as to the extent of usage throughout the student population may be raised. It appeared that in most cases only a relative few teachers and students were involved with using telecommunications at each school.

Teacher expertise in the total sample was wide-ranging from a majority having very limited knowledge and experience using computers to a select number of "expert" users. Experience within schools ranged from schools with little or no expertise among faculty (most schools) to a handful of schools where the majority of the teachers were experienced users. Schools reported limited formal in-service training. What training was offered, was provided through the district or through the Mid-Illini Regional Service Center. Informal training was given through peer teaching by the most experienced faculty computer users. Some university coursework was reported by individual teachers, however there appeared to be no concerted effort to train entire faculties by using graduate coursework.

One school reported a strategic plan for the purchase, maintenance, and replacement of computers and technology. Other schools reported the purchase and maintenance of computers on a funds available basis. Significantly lacking throughout the Tri- County area, was an upgrade plan to keep each school current with changing technological developments.

Qualitatively, schools are limited by the lack of teacher experience and type of software Quantitatively, however, the Tri-County area has the necessary hardware to effectively use computers in instruction. This is evidenced by the student/computer ratio and the number of schools owning computers. The potential for the successful implementation of computers in the Tri-County area hinges upon the development of a clear-cut plan for the integration of technology into the schools at the district level.

Reference

Kondracke, M. (1992, September). The official word. *MacWorld*, pp. 232-236.

APPENDIX

Tri-County Educational Computing Survey

The purpose of this survey is to gather descriptive data on the current state of K-12 educational computing in the Tri-County (Peoria, Tazewell, and Woodford) area. Please respond to as many questions as pertain to your school.

Person Completing Survey _____

School _____ District # _____ Phone # _____

Grade Levels in Building (eg. K-8, 9-12) _____

Number of Students in Building _____

1. Number of computers dedicated to academic (non-administrative) use _____

   **If computers are not being used at your school, then you may stop here. Please return the survey in the envelope provided.*

2. Make(s) [eg. Apple] , model(s) [eg. //e] and number of computer(s) in use

Make	Model	Number
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

3. Location of computer(s)

Location	**Number**
Classroom	_____
Lab	_____
Library	_____
Other	_____

4. Computer Usage by Grade Level / Subject Area

4a. For each grade level in your building, indicate the number of students, number of computers and the frequency of computer usage (approximate hours per week)

Grade Level	**Number of Students**	**Number of Computers**	**Computer Usage** (hours per week)
Kindergarten	_____	_____	_____
First	_____	_____	_____
Second	_____	_____	_____
Third	_____	_____	_____
Fourth	_____	_____	_____
Fifth	_____	_____	_____
Sixth	_____	_____	_____
*Seventh	_____	_____	_____
*Eighth	_____	_____	_____

*** For self-contained classrooms only. Include departmentalized information in following item.**

4b. Indicate the frequency of computer usage (approximate hours per week) by subject.

Subject	**Computer Usage** (hours per week)
art	_____
business	_____
foreign language	_____
industrial arts	_____
language arts	_____
math	_____
music	_____
science	_____
social science	_____
Other (specify below)	
_____	_____

5. Type(s) of Educational Software In Use

Tutorial - presents new information.
Drill - provides practice for existing knowledge.
Simulation - enables students to experience an imitation of some aspect of the world.
Instructional Game - provides practice or instruction in an entertaining format.
Tool - word processing, database, spreadsheet, CAD, graphics

5a. Indicate the types of educational software in student use in your school by grade level.

Grade Level	**Type(s) of Software**
Kindergarten	_____
First	_____
Second	_____
Third	_____
Fourth	_____
Fifth	_____
Sixth	_____
*Seventh	_____
*Eighth	_____

*** For self-contained classrooms only. Include departmentalized information in following item.**

5b. Indicate the types of educational software in student use in your school by subject area.

Subject	**Type(s) of Software**
art	_____
business	_____
foreign language	_____
industrial arts	_____
language arts	_____
math	_____
music	_____
science	_____
social science	_____
Other (specify below)	
_____	_____

6. List your schools "top ten" of educational software, ie. the ten most frequently used programs.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

7. Does your school have a modem for instructional use? **Yes** **No**

If yes, describe how your school is using telecommunications in instruction.

_____

_____

_____

_____

List some projects your students have worked on.

_____

_____

_____

_____

List any telecommunications services that your students or teachers use (eg. FrEdMail, AT&T, Compuserve, etc.).

_____

_____

_____

8. Describe the level (novice, experienced users), type (in-service, college course), and frequency of teacher training on computers at your school.

9. Describe the policies for purchasing, maintaining, and replacing computers at your school.

10. Other aspects of educational computing at your school that you would like to share

Thank you for completing this survey. Please return it in the envelope provided. Would you like a copy of the completed report ? Yes No